CLAIMS

1. A hyperbaric resuscitation system comprising:

(a) a hyperbaric chamber having a volume sufficient to enclose a human patient;

(b) first pressurizing means for pressurizing the hyperbaric chamber to at least 1.5 atmospheres;

(c) means for providing oxygen-rich gas to be breathed by the patient;

(d) second pressurizing means for pressurizing the oxygen-rich gas to a pressure similar to that of the hyperbaric chamber;

(e) a non-invasive monitoring means for monitoring oxygen in cerebral tissue of the patient; and

(f) regulating means for regulating the concentration of oxygen in the oxygen-rich gas in response to readings of the non-invasive monitoring means.

2. The system of claim 1, further comprising analyzing means for analyzing readings of the non-invasive monitoring means.

3. The system of claim 1, wherein the non-invasive monitoring means includes means for monitoring trends in oxygen content.

4. The system of claim 1, wherein the non-invasive monitoring means includes means for monitoring oxidized cytochrome oxidase, reduced cytochrome oxidase, oxygenated hemoglobin, and deoxygenated hemoglobin.

5. A hyperbaric resuscitation system comprising:

(a) a hyperbaric chamber having a volume sufficient to enclose a human patient;

(b) first pressurizing means for pressurizing the hyperbaric chamber to at least 1.5 atmospheres;

(c) means for providing oxygen-rich gas to be breathed by the patient;

(d) second pressurizing means for pressurizing the oxygen-rich gas to a pressure similar to that of the hyperbaric chamber;

(e) a spectrophotometer for monitoring oxygen in cerebral tissue of the patient; and

(f) regulating means for regulating the concentration of oxygen in the oxygen-rich gas in response to readings of the spectrophotometer.

6. The system of claim 5, further comprising analyzing means for analyzing readings of the spectrophotometer.

7. The system of claim 5, further comprising means for automatically regulating oxygen concentration and pressure using information from the spectrophotometer.

8. A hyperbaric resuscitation method comprising:

(a) placing a patient in a hyperbaric chamber having a volume sufficient to enclose a human patient;

(b) pressurizing the hyperbaric chamber to at least about 1.5 atmospheres;

(c) providing oxygen-rich gas to be breathed by the patient;

(d) pressurizing the oxygen-rich gas to a pressure similar to that of the hyperbaric chamber;

(e) monitoring oxygen in cerebral tissue of the patient with a non-invasive monitoring means; and

(f) regulating the concentration of oxygen in the oxygen-rich gas in response to readings of the non-invasive monitoring means.

9. The method of claim 8, further comprising the step of analyzing readings of the non-invasive monitoring means.

10. The method of claim 8, wherein the non-invasive monitoring means includes means for monitoring trends in oxygen content.

11. The method of claim 8, wherein the non-invasive monitoring means includes means for monitoring oxidized cytochrome oxidase, reduced cytochrome oxidase, oxygenated hemoglobin, and deoxygenated hemoglobin.

12. A system comprising:

(a) a chamber having a volume sufficient to enclose a human patient;

(b) first pressure regulating means for causing the chamber to have a pressure of about 1-4 atmospheres;

(c) means for providing oxygen-rich gas to be breathed by the patient;

(d) second pressure regulating means for causing the oxygen-rich gas to have a pressure similar to that of the chamber;

(e) a non-invasive monitoring means for monitoring oxygen in cerebral tissue of the patient; and

(f) oxygen regulating means for regulating the concentration of oxygen in the oxygen-rich gas in response to readings of the non-invasive monitoring means.

13. The system of claim 12, further comprising analyzing means for analyzing readings of the non-invasive monitoring means.

14. The system of claim 12, wherein the non-invasive monitoring means includes means for monitoring trends in oxygen content.

15. The system of claim 12, wherein the non-invasive monitoring means includes means for monitoring oxidized cytochrome oxidase, reduced cytochrome oxidase, oxygenated hemoglobin, and deoxygenated hemoglobin.

16. The system of claim 12, wherein the non-invasive monitoring means monitors oxygen availability to the cerebral tissue.

17. A system comprising:

(a) a chamber having a volume sufficient to enclose a human patient;

(b) first pressure regulating means for causing the chamber to have a pressure of about 1-4 atmospheres;

(c) means for providing oxygen-rich gas to be breathed by the patient;

(d) second pressure regulating means for causing the oxygen-rich gas to have a pressure similar to that of the chamber;

(e) a spectrophotometer for monitoring oxygen in cerebral tissue of the patient; and

(f) oxygen regulating means for regulating the concentration of oxygen in the oxygen-rich gas in response to readings of the spectrophotometer.

18. The system of claim 17, further comprising analyzing means for analyzing readings of the spectrophotometer.

19. The system of claim 17, further comprising means for automatically regulating oxygen concentration and pressure using information from the spectrophotometer.

20. A treatment method comprising:

(a) placing a patient in a chamber having a volume sufficient to enclose a human patient;

(b) regulating the pressure of the chamber at about 1-4 atmospheres;

(c) providing oxygen-rich gas to be breathed by the patient;

(d) maintaining the oxygen-rich gas at a pressure similar to that of the chamber;

(e) monitoring oxygen in cerebral tissue of the patient with a non-invasive monitoring means; and

(f) regulating the concentration of oxygen in the oxygen-rich gas in response to readings

of the non-invasive monitoring means.

21. The method of claim 20, further comprising the step of analyzing readings of the non-invasive monitoring means.

22. The method of claim 20, wherein the non-invasive monitoring means includes means for monitoring trends in oxygen content.

23. The method of claim 20, wherein the non-invasive monitoring means includes means for monitoring oxidized cytochrome oxidase, reduced cytochrome oxidase, oxygenated hemoglobin, and deoxygenated hemoglobin.

24. A system comprising:

(a) a light source and connecting fiber optics;

(b) a near infrared band pass filter;

(c) a pickup optode unit;

(d) a dual wave interval spectrophotometer for sensing and recording a NIR wavelength interval;

(e) a personal computer with software algorithm to separate the cytochrome oxidase, water and hemoglobin absorbance curves for evaluation and display.

25. The system of claim 24, wherein the light source is a stabilized pulsed light.

26. A method of using the system of claim 24 to monitor the change of any natural or manmade chromophore existing in the brain to assist in the diagnosis or treatment of a neurological or psychotic disorder.

27. The invention of any one of claims 1-23, wherein the chamber has a volume sufficient to enclose a human patient and at least two operating personnel.

28. The invention of any one of claims 1-27, wherein the non-invasive monitoring means or spectrophotometer monitors relative changes in redox levels in real-time.

29. The invention of any one of claims 1-27, wherein Fourier transforms are used in analyses of near infrared data obtained from the non-invasive monitoring means or spectrophotometer.

30. The invention of any one of claims 1-27, wherein the non-invasive monitoring means or spectrophotometer includes:

a background pickup device which receives photons that have traversed the scalp and skull but not deep enough to reach the cerebral cortex,

a sample pickup device that is positioned to receive photons that have traversed the scalp, skull dura matter, and pia, and

the background signal is subtracted from the sample signal to result in a signal representing the cerebral cortex.

31. The system of claim 24, wherein the light source is a quartz halogen 150 watt light source.

32. The system of claim 24, wherein the NIR wavelength interval is about 700-1050 nm.

33. A system for providing oxygen-rich gas to be breathed by a patient comprising:

(a) means for providing oxygen-rich gas to be breathed by the patient;

(b) a non-invasive monitoring means for monitoring oxygen in cerebral tissue of the patient; and

(c) regulating means for regulating the concentration of oxygen in the oxygen-rich gas in response to readings of the non-invasive monitoring means.

34. The system of claim 33, further comprising analyzing means for analyzing readings of the non-invasive monitoring means.

35. The system of claim 33, wherein the non-invasive monitoring means includes means for monitoring trends in oxygen content.

36. The system of claim 33, wherein the non-invasive monitoring means includes means for monitoring oxidized cytochrome oxidase, reduced cytochrome oxidase, oxygenated hemoglobin, and deoxygenated hemoglobin.

37. The invention of any one of claims 33-36, wherein the non-invasive monitoring means monitors relative changes in redox levels in real-time.

38. The invention of any one of claims 33-37, wherein Fourier transforms are used in analyses of near infrared data obtained from the non-invasive monitoring means.

39. The invention of claim 38, wherein Fourier deconvolution is used in analyses of near infrared data obtained from the non-invasive monitoring means.

40. The invention of any prior claim, wherein oxygen in cerebral tissue is monitored by monitoring cytochrome oxidase in the cerebral tissue.

41. The invention of any prior claim, wherein oxygen in cerebral tissue is monitored by monitoring the redox ration of cytochrome oxidase in the cerebral tissue.

42. The invention(s) substantially as shown and/or described herein.